APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,097	03/23/2000	Shuichi Shimizu	JA998-036X	9099

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EXAMINER
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2135	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	09/534,097	SHIMIZU ET AL.
	Examiner	Art Unit
	Thanhnga Truong	2172

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 March 2000</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-21</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-17, 20 and 21</u> is/are rejected.

7)☐ Claim(s) <u>18 and 19</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>23 March 2000</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☒ Certified copies of the priority documents have been received in Application No. <u>09/534,097</u> .

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6</u> .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1, 2, 10, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Barton (US 6,163,842).

      a.   *Referring to claim 1:*

           i.   Barton teaches:

              (1)   means for preparing information to be embedded as bits in a bit stream **[i.e., an authentication system for digital information in which data are embedded in a bit stream, whereby the embedding process is shown in Figure 1 (column 4, line 55)]**;

              (2)   means for alternating the signs of said bit stream in accordance with a sign inversion cycle **[i.e., modifying an original bit stream, that is for "alternating the signs of said bit stream". Accordingly, precise reconstruction of the original bit stream requires the inclusion within the bit stream of an accurate record of the bits before modification (column 4, lines 56-59)]**; and

              (3)   means for embedding said bit stream in said frames **[i.e., embedded the resulting bit string into the data block 20 in Figure 1, that is "frames" (column 6, line 33)]**.

      b.   *Referring to claim 2:*

           i.   Barton further teaches:

(1)   the motion picture electronic watermark system according to claim 1, wherein said means (2) includes means for adding sign bits to said bit stream **[i.e., assume the use of Lempel-Ziv compression to achieve a 2:1 compression ratio of the original bits from the image. This adds an additional 562 bits of data to be embedded (column 8, lines 65-67 through column 9, line 1)].**

    c.   *Referring to claim 10:*

        i.   This claim has limitations that is similar to those of claim 1, thus it is rejected with the same rationale applied against claim 1 above.

    d.   *Referring to claim 13:*

        i.   This claim has limitations that is similar to those of claim 1, thus it is rejected with the same rationale applied against claim 1 above.

3.   Claims 3-9, 11-12, 14, 16, and 20-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Haitsma et al (US 6,505,223 B1).

    a.   *Referring to claim 3:*

        i.   Haitsma teaches:

(1)   means for accumulating values through observation of frames **[i.e., Figure 4 shows a schematic diagram of a watermark detector. The watermark detector receives possibly watermarked images Q. Watermark detection in JAWS is not done for every single frame, but for groups of frames. By accumulating (21) a number of frames the statistics of detection is improved and therefore also the reliability of detection (column 3, lines 27-32)]**;

(2)   means for comparing the accumulated values through observation with threshold values that vary in accordance with said accumulated values **[i.e., the watermark is detected by computing the correlation of the suspect information signal with an applied watermark pattern, and comparing the correlation with a predetermined threshold (column 1, lines 16-19)]; and**

(3)   means for employing the comparison results to detect said embedded information **[i.e., if the correlation is larger than the threshold (that is "for employing the comparison results"), the watermark is said to be present (that is "to detect said embedded information"), otherwise it is said to be absent.**

The larger the correlation is, the more reliable the detection is and the more processing is allowed until the watermark can not be detected anymore (column 1, lines 19-23)].

      b.   *Referring to claim 4:*

          i.   This claim has limitations that is similar to those of claim 3 (1), thus it is rejected with the same rationale applied against claim 3 (1) above.

      c.   *Referring to claim 5:*

          i.   Haitsma further teaches:

              (1)   wherein before accumulating said values obtained through observation of said frames, said means (1) changes the signs of said values **[i.e., in order to embed the multi-bit code K in the watermark W, every tile W(K) is built up from a limited set of uncorrelated basic or primitive tiles {W_1 . . . W_n} and shifted versions thereof; and the signs s(epsilon){-1,+1} and the shifts k depend on the key K via an encoding function E (13), as shown in Figure 1 (column 3, lines 10-22)]**.

      d.   *Referring to claim 6:*

          i.   Haitsma further teaches:

              (1)   wherein at intervals of half a sign inversion cycle, said means (1) inverts the signs of said values obtained through observation of frames and accumulates the sign inverted values **[i.e., in Figure. 4, the conjugation of w (means inverting the sign) is carried out by a conjugation circuit 26 (column 4, lines 35-37)]**.

      e.   *Referring to claim 7:*

          i.   Haitsma further teaches:

              (1)   wherein at intervals of one quarter of said sign inversion cycle, said means (1) stores all values obtained through observation of frames in two accumulators A and B in the order addition for A, addition for B, subtraction for A and subtraction for B **[i.e., the accumulated frames are subsequently partitioned (22) into blocks of size MxM (M=128) and all the blocks are stacked (23) in a buffer**

q of size MxM. This operation is known as folding. FIG. 5 illustrates this operation of folding (column 3, lines 33-36)].

      f.   *Referring to claim 8:*

          i.   Haitsma further teaches:

              (1)   wherein said means (1) prepares two accumulators A and B, and accumulates values obtained by observation of frames in said accumulator A at intervals of one quarter of said sign inversion cycle, in the order addition for A, addition for A, subtraction for A and subtraction for A, and in parallel to this process, accumulates values obtained by observation of frames in said accumulator B in the order addition for B, subtraction for B, subtraction for B and addition for B **[i.e., Figure 4 shows a schematic diagram of a watermark detector. The watermark detector receives possibly watermarked images Q. Watermark detection in JAWS is not done for every single frame, but for groups of frames. By accumulating (21) a number of frames the statistics of detection is improved and therefore also the reliability of detection (column 3, lines 27-32); and Figure 6B shows the graph of correlation values if watermark pattern W_2 is applied to the detector. Two peaks are now found. The positive peak 62 at (0,0) denotes the presence of watermark W_2, the negative peak 63 at (48,80) denotes the presence of watermark $-W_2$ ' (column 4, lines 52-57)].**

      g.   *Referring to claims 9 and 21:*

          i.   Haitsma further teaches:

              (1)   when a bias exists in the signs of values accumulated in said two accumulators, providing an upper limit for said bias **[i.e., The signs s.epsilon.[-1,+1] and the shifts k depend on the key K via an encoding function E (13), in which "provides an upper limit for said bias" (column 3, lines 20-22)].**

      h.   *Referring to claim 11:*

          i.   This claim has limitations that is similar to those of claim 3, thus it is rejected with the same rationale applied against claim 3 above.

      i.   *Referring to claim 12:*

          i.   Haitsma further teaches:

(1)   A recording medium **[i.e., FIG. 7 shows a DVD drive for playing back an MPEG bitstream which is recorded on a disc 71 (column 4, lines 66-67)]** for storing a motion picture electronic watermark detection program, for employing statistical observation of frames to detect embedded information, said program comprising:

(1)   This claim has limitations that is similar to those of claim 3 (1), thus it is rejected with the same rationale applied against claim 3 (1) above;

(2)   This claim has limitations that is similar to those of claim 3 (2), thus it is rejected with the same rationale applied against claim 3 (2) above; and

(3)   This claim has limitations that is similar to those of claim 3 (3), thus it is rejected with the same rationale applied against claim 3 (3) above.

j.   *Referring to claims 14 and 20:*

i.   These claims has limitations that is similar to those of claim 3, thus they are rejected with the same rationale applied against claim 3 above.

k.   *Referring to claim 16:*

i.   Haitsma further teaches:

(1)   wherein said means (1) removes an overlapping positional relationship, using a history of a relative positional relationship between frames, when information is embedded and when said information is detected, so that a correlation existing among sequential frames is removed and values are accumulated through observation of said frames **[i.e., the invention exploits the insight that the correlation of the information signal and the applied watermark for a number of possible positions of the watermark is best computed, that is "removes an overlapping positional relationship", in the Fourier domain, and that the robustness and reliability of detection can be improved by applying Symmetrical Phase Only Matched Filtering (SPOMF) to the information signal and the watermark before correlation (column 1, lines 42-49)].**

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haitsma, and further in view of Adler et al (US 6, 088, 123).

a.   *Referring to claims 15 and 17:*

    i.   Haitsma teaches the claimed subject matter except for:

(1)   wherein said means (1) accumulates values through observation of frames, using a periodical detection mask that does not depend on relative positions, when information is embedded and when said information is detected.

(2)   wherein said means (1) uses multiple masks to embed and detect information, and (2) removes duplicate values obtained from the same mask, so that a correlation existing among sequential frames is removed and values are accumulated through observation of said frames.

    ii.   However, Adler teaches:

(1)   Blue noise masks are usually presented in the literature as being aperiodic, but they do have a period, namely, the dimensions of the mask. This periodicity is detectable, with unpleasant effect, in prints made using such masks **(column 2, lines 34-37).**

    iii.   It would have been obvious to a person having ordinary skill in the art at the time the invention was made to:

(1)   include such aperiodic mask (in Haistma) since digital halftoning and, more particularly, to a method and apparatus for halftoning constructs and utilizes a dithering mask with memory requirements much smaller than the mask itself **(column 1, lines 6-10 of Adler).**

    iv.   The ordinary skilled person would have been motivated to:

(1)   add such aperiodic mask (in Haistma) since the fastest and most commonly used methods for digital halftoning are dithering algorithms which use threshold arrays, also called dither matrices or dither masks. The original forms of these arrays used periodic patterns of threshold values which can have an unpleasant rendering at certain grey levels. Adler discloses a method and apparatus which halftones an image using a truly aperiodic mask, thus avoiding periodic patterns **(column 1, lines 20-28 of Adler).**

Allowable Subject Matter

6.   Claims 18 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.   Nakano (US 6, 421, 450) discloses An electronic watermark system invisibly embeds watermark information into original image data and the watermarked image data is transferred to a first medium. At the same time, the embedded watermark information is transferred to a second medium. When a medium questioned is found, its watermark information can be easily identified by searching the second medium (see abstract).

b.   Linnartz (US 6, 252, 972) discloses Recently developed methods for copy protection rely on a watermark detector to judge whether multimedia content can be copied or not. In such copy protection schemes, a watermark detector examines the multimedia content and outputs a signal (D) indicating whether a watermark is present or not (see abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhnga (Tanya) Truong whose telephone number is 703-305-0327.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 703-305-4393. The fax and
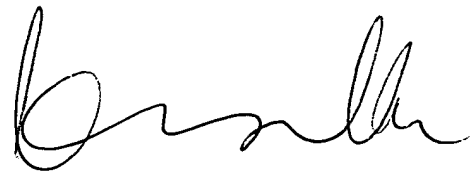
phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

TBT

December 8, 2003

KIM VU
SUPERVISORY PATENT EXAMINER
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